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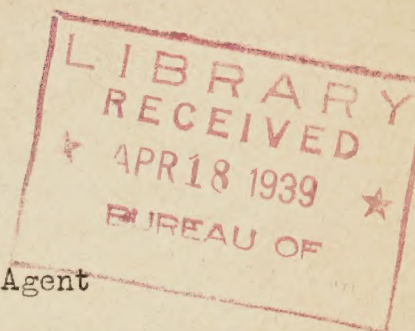
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THE EFFECTS OF VARIOUS CULTURAL TREATMENTS
ON PINK BOLLWORM SURVIVAL AND EMERGENCE

by

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Experiments were conducted at Presidio, Tex. during the past three years to determine the effects of several winter and spring cultural treatments on the survival and emergence of the pink bollworm (Pectinophora gossypiella Saunders). Although the experiments were conducted in cages, every effort was made to simulate field conditions, and it is reasonable to believe that the results would be applicable under actual farm practice.

METHOD

The experiment was divided into three series to determine the influence of the following cultural treatments on survival and time of emergence:

- Series I. The effects of time of winter burial plus winter irrigation on survival.
- Series II. The effects of time of winter burial on survival.
- Series III. The effects of the time of application of a spring or preplanting irrigation on the time of emergence.

There were twelve different cultural treatments tested in the three series with six hibernation cages for each of the treatments. Three of the cages in each treatment contained larvae overwintering in cocoons and three contained larvae overwintering in cotton bolls. Several thousand larvae in each type of material were installed per treatment. The larvae were buried at three approximate depths, 2 inches, 4 inches, and 6 inches. In addition to the winter treatments all cages received a spring or preplanting irrigation which is ordinarily applied in the field. The cages were covered with cloth and equipped with traps on April 1, and the daily moth emergence was recorded through June 30.

SURVIVAL

In cocoons.--There was very little emergence from the larvae installed in cocoons. It is thought that the low survival from this material was largely due to technique in the installation of the worms. It is difficult, in installing this type of material, to simulate all

the conditions occurring in the field. Although there was not sufficient emergence from the cocoons to justify forming definite conclusions, the survival from the various cultural treatments followed the same trend as that in the bolls.

In bolls.--The survival in bolls from the various treatments in Series I and II over a 3-year period is shown in table 1 and figure 1. The records on the figure are based on a 3-year average, 1936-38. Approximately 100,000 larvae in bolls were installed and approximately 8,000 moths emerged from the two series over the 3-year period.

As shown in table 1, there was a lower survival from the infested bolls that were buried and the soil irrigated during the winter (Series I) than from bolls that were buried but the soil not irrigated during the winter (Series II). The earlier in the winter the material was buried and watered, the lower the survival, whereas the earlier in the winter the material was buried but not watered, the higher the survival. Two winter irrigations following winter burial appeared to be more effective than one irrigation. It might be stated that small differences in the percentage survival are significant when we consider the large overwintering worm population on an acre of land. As shown in table 1, the survival from the various treatments followed about the same trend each year. The only significant exception was in the case of the January-buried bolls in Series II. For some unknown reason the survival from this treatment in 1938 was considerably lower than in the two previous years.

The effect of the time of application of a spring irrigation on the time of emergence is shown in table 2 and figure 2. The data for the figure was compiled from the 2-year average. As shown in figure 2 and table 2, delaying the application of the spring irrigation delayed the emergence. It will also be noted that delaying the irrigation tended to "bunch" the emergence, especially in the April 20 irrigation treatment. This was undoubtedly due to the fact that the temperatures were more favorable for emergence at the latter date.

The effect of the different depths of burial on the emergence over the 3-year period is shown in table 3 and figures 3. The percentage survival from the three depths are based on the total moths that emerged, and not on the larvae installed. Of the 10,058 moths that emerged from the three series over the 3-year period, 6,440, or 64.03 per cent, came from the 2-inch depth, 2,697, or 26.81 per cent, from the 4-inch depth, and 921, or 9.16 per cent, came from the 6-inch depth.

Table 1.--Comparison of pink bollworm survivals in bolls in the hibernation experiment at

Presidio, Tex. in 1936, 1937, and 1938, as shown by the percentages of moths emerging.

Treatment	Per cent Survival			
	1936	1937	1938	Average
Bolls buried Dec. 1, irrigated Dec. 15, Jan. 15, and March 15	1.37	2.17	3.89	2.48
Boll buried Dec. 1, irrigated Dec. 15 and March 15	2.32	7.51	4.93	4.92
Bolls buried Jan. 1, irrigated Jan. 15, Feb. 15, and March 15	1.66	6.91	4.56	4.38
Bolls buried Jan. 1, irrigated Jan. 15 and March 15	2.86	7.51	7.97	6.11
Bolls buried Feb. 1, irrigated Feb. 15 and March 15	3.40	10.63	7.00	7.01
Series II				
Bolls buried Dec. 1, irrigated March 15	13.28	23.62	15.70	17.53
Bolls buried Jan. 1, irrigated March 15	10.24	15.70	6.81*	10.92
Bolls buried Feb. 1, irrigated March 15	5.38	13.43	12.04	10.29
Bolls buried March 1, irrigated March 15	5.67	9.23	9.10	8.00

*The low survival from this treatment was attributed to factors other than the cultural treatments indicated.



-Comparison of percentages of total emergence of pink bollworm moths from bolls Given an early and those given delayed preplanting irrigations in a hibernation experiment at Presidio, Tex. in 1937 and 1938.

Date	Buried Dec. 1 Irrigated March 10			Buried Dec. 1 Irrigated April 1			Buried Dec. 1 Irrigated April 20		
	1937	1938	Average	1937	1938	Average	1937	1938	Average
April 1-7	0.00	0.33	0.16	0.00	0.00	0.00	0.00	0.54	0.27
8-14	0.00	0.66	0.33	0.00	0.00	0.00	0.81	2.15	1.48
15-21	1.15	6.62	3.88	0.21	0.00	0.10	0.81	3.76	2.28
22-28	15.00	41.72	28.36	1.26	4.30	2.78	0.81	3.76	2.28
29-May 5	51.92	64.90	58.41	32.21	12.90	22.55	2.23	4.84	3.53
May 6-12	77.88	81.46	79.67	61.72	37.63	49.67	4.45	6.99	5.72
13-19	88.08	94.70	91.39	78.45	82.80	80.62	58.10	82.80	70.45
20-26	93.27	97.68	95.47	90.59	87.10	88.84	85.83	95.70	90.76
20-June 2	96.73	99.34	98.03	94.77	90.32	92.54	93.92	99.46	96.69
June 3-9	98.46	99.67	99.06	98.12	94.62	96.37	97.77	100.00	98.88

-Comparison of pink bollworm survivals based on percentages of total emergence of moths from bolls buried at different depths in a hibernation experiment at Presidio, Tex., in 1936, 1937, and 1938

Year	Series	Total Emergence: From all Nos.	2-inch Depth Numbers of Moths Emerged	Percentage Survival	4-inch Depth Numbers of Moths Emerged	Percentage Survival	6-inch Depth Number of Moths Emerged	Percentage Survival
1936	I and II:		760	<u>47.09</u>	633	<u>39.22</u>	221	<u>13.69</u>
1937	I-II and III:		3,849	<u>70.04</u>	1,206	<u>21.94</u>	441	<u>8.02</u>
1938	I-II and III:		1,831	<u>62.11</u>	858	<u>29.10</u>	259	<u>8.79</u>
Total			10,058		2,697		921	
Average				<u>64.03</u>		<u>26.61</u>		<u>9.16</u>

